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RESULTS OF SCIENTIFIC RESEARCH OF THE ACADEMY OF SCIENCES AZERBAYDZHAN SSR, 1948

The scientific research work of the Academy of Sciences Azerbaydzhan SSR in 1948 was directed at furnishing utmost assistance to the petroleum industry and agriculture of the republic, and the development of science and culture in Soviet Azerbaydzhan.

Azerbaydzhan was, is, and will continue to be the chief petroleum base of the Soviet Union. In 1948 the academy's geologists made a close study of petroleum deposits and deposits of useful minerals. In the first half of 1948 the main group of collaborators of the Geology Institute worked on projects suggested by the Azerbaydzhan petroleum expedition. This expedition conducted its activities by authority of the Academy of Sciences USSR and the Academy of Sciences Azerbaydzhan SSR, and in conjunction with "Azneft" and "Aznefterazvedka." For 3 years the expedition conducted field work in the chief petroleum regions of Azerbaydzhan. On the basis of a critical analysis of all materials accumulated by the petroleum industry of Azerbaydzhan and on the basis of large-scale research studies, areas were designated for survey in the near future with the aim of expanding existing and searching for new petroleum deposits. Maps of oil-bearing regions of the republic were provided.

The expedition completed the first phase of its work on 1 July 1948, when it presented a scientific report on its activities in 44 volumes with 19 supplements. Fourteen of the volumes were compiled by the workers of the Academy, who also took a significant part in compiling 11 others.

Among the great works completed by geologists in 1948 was the three-volume Geology of Azerbaydzhan. The first volume, consisting of 1,280 pages with a supplement of geological maps on a scale of 1:5,000,000 (in color), has just been printed; the second volume is being edited; the third ("Useful Minerals") will be completed in September 1949.

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One of the more important tasks confronting the oil-drilling industry is the solution of problems in secondary methods of exploiting oil deposits. The Buzovnyneft' Trust carried out a plan of contour flooding developed by the Petroleum Institute. Steps have been taken to bring the process to top efficiency. At the Stalinneft Trust pumping of air resulted in increased well output. When all of the projected wells are put into operation, the output should be increased greatly.

In 1948 the academy developed and tested under industrial conditions many technical innovations in drilling and the exploitation of oil deposits. Tests on gravel filters, clay mortars, and deparaffination were successful, and more extensive utilization is being sponsored by the Ministry of the Petroleum Industry and by Azneft' and Aznefterazvedka trusts.

In the field of petroleum refining, emphasis must be placed on obtaining a product which has extremely great national economic and national defense value.

In the development of the research work of Academician N. D. Zelinskiy, founder of the Soviet school of catalysis, a new catalytic process was worked out at the academy. This new process will permit expansion of the country's resources of this product by two to three times. All the fundamental characteristics of the process were obtained for different types of raw materials. A decree of the Ministry of the Petroleum Industry USSR outlined measures for implementation of the process. At present plans for building experimental plant units are in process.

Work was conducted on the synthesis of "triptane," one of the isomers of heptane which processes high detonation stability. According to some data, power obtained from this hydrocarbon is almost three times the engine power obtained from isooctane. In the development of studies made by Butlerov, El'tekov, and other Russian chemists, an original method for synthesizing triptane or, as we call it, Butlerov's heptane, was worked out on a laboratory scale at our Academy.

Scientific research work in agriculture was directed toward obtaining higher and more stable yields of agricultural crops.

In 1948 the effects of new phosphorus-organic fertilizers, obtained on a base of acid petroleum asphalt, were studied. Field experiments revealed that on certain types of soils in Azerbaydzhan those fertilizers increase crop yields much more than the conventional superphosphate type. A technological process for obtaining phosphorus-organic fertilizers, which is quite simple and involves a simple mixture of determined quantities of phosphorites with acid petroleum asphalt, a waste product of the petroleum industry, was developed at the Academy. The Council of Ministers USSR, by decree of 19 March 1949, directed the Ministry of the Chemical Industry USSR, the Ministry of the Petroleum Industry USSR, and the Council of Ministers Azerbaydzhan SSR to develop measures for the organization in 1949 - 1950 -- at oil-refining plants located in Baku -- of sections for the production of phosphoric acid fertilizers using refinery waste products from acid petroleum asphalt according to the method developed by the Academy of Sciences Azerbaydzhan SSR.

To improve soil structure and the water and temperature system of plants, the Institute of Agrochemistry and Soil Science proposed the use of another waste produce from oil refineries, waste gumbrin. Waste gumbrin obtained during the refining of oils contains up to 50 percent of organic matter and considerable supplies of it are available at Baku. Field tests indicated that the application of waste gumbrin reduces loss of soil moisture, regulates the temperature cycle, improves the structure of the soil, and prevents

crust formation. The use of gumbrin may increase the productivity of the cotton plant. The Council of Ministers and the TsK KP(b) Azerbaydzhan ordered large-scale tests of gumbrin during 1949 on 33 collectives on an area greater than 500 hectares. These tests were successful.

The Botany Institute has conducted a study of wild plants. As a result of this work, several types of plants, such as mint, summer savory, fennel, wormwood, cow parsnip, caropodium, and others which contain large amounts of valuable essential oils will be utilized. Among these, caropodium, which grows in certain rayons of Nakhichevan ASSR, is of the greatest interest. A detailed study of caropodium indicated that, in content of essential oils and linalool, this plant significantly surpasses the widely cultivated USSR coriander. The seeds of caropodium contain from 2.0 to 2.5 percent essential oil and an average of 72 percent of linalool, whereas coriander contains 0.5 to 0.8 percent of essential oil and 60 percent linalool. Carpodium is drought resistant, has noncrumbling seeds, and is immune to blight and disease. It can be grown in many regions of Azerbaydzhan and other republics. The area seeded with caropodium in 1949 will be increased to 400 hectares. By a 24 February 1949 decree of the Council of Ministers USSR, caropodium was included among essential-oil plants.

In 1948 the Institute of Zoology and the Kirovabad Base of the academy conducted extensive work on a new, highly productive breed of sheep. At present there has already been obtained a generation of mixed breeds with fine characteristics.

In accordance with a decree of the Council of Ministers Azerbaydzhan SSR, beginning 15 June 1948 the Power Institute imeni I. G. Yes'man conducted extensive work in connection with the preparation of a general plan for the electrification of Azerbaydzhan agriculture.

Important work in the humanitarian sciences was also conducted during 1948. In connection with the building of the Mingechaur hydroelectric unit, archaeologists of the academy conducted extensive studies at the construction site and in the areas being flooded. They discovered more than 700 graves and more than 800 various types of articles made from ceramics, steel, bronze, silver, gold, and precious stones. These discoveries reveal that the Azerbaydzhanian people established their material and spiritual values and developed their original culture in close relation with the more advanced nations of the ancient world. Many of the items found in Mingechaur appear to have been plundered by Arab marauders.

In 1948, Albanian inscriptions of great historical and scientific value were discovered for the first time on Azerbaydzhan territory. Workers of the archaelogical expedition in Kabristan discovered and gathered a tremendous collection of rocks engraved with serpents, lizards, horses, hunting scenes, the ritual dance, etc. The majority of these engravings date back to the bronze age. On the southeastern side of the Beyuk-Dash foothills a Latin inscription dating back to the first century of our era was found. Evidently this had been inscribed by Roman legionnaires during the stay of the 12th Legion on the shores of the Caspian. Its discovery throws new light on the movements of the Roman legions in Azerbaydzhan.

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